

Claims

We claim:

1. A composition for chemical mechanical planarization comprising an aqueous oxidizer wherein said aqueous oxidizer comprises hydroxylamine and a material selected from the group consisting of hydroxylamine nitrate, hydroxylamine sulfate, ammonium salts and mixtures thereof.
2. A composition as in claim 1 further comprising a material selected from the group consisting of insoluble complexing agents, soluble complexing agents, free radical inhibitors and mixtures thereof.
3. A composition as in claim 2 wherein said insoluble complexing agent is selected from the group consisting of benzotriazole, 1,6-dioxaspiro [4,4] nonane 2,7-dione, dioximes and mixtures thereof.
4. A composition as in claim 3 wherein said dioxime is 2,4 pentadione dioxime.
5. A composition as in claim 2 wherein said soluble complexing agent is selected from the group consisting of citric acid, copper-complexing catechol derivatives, copper-complexing alpha organic acids, copper-complexing hydroxamic acids, copper-complexing amino acids, copper-complexing dicarboxylic acids and mixtures thereof.
6. A composition as in claim 2 wherein said free radical inhibitor is selected from the group consisting of hydrazine, hydrazine derivatives, hydrazine salts, hydrazids, hydrazid derivatives, and mixtures thereof.
7. A composition as in claim 6 wherein said hydrazine derivative is 4-hydrazine benzoic acid.
8. A composition as in claim 1 further comprising an abrasive.
9. A composition as in claim 8 wherein said abrasive is selected from the group consisting of silica, alumina, ceria, titania, zirconia and mixtures thereof.
10. A composition as in any one of claims 1-9, further comprising sufficient acid such that the

pH of said composition is in the range from approximately 2.0 to approximately 5.0.

11. A composition for chemical mechanical planarization comprising an aqueous oxidizer wherein said aqueous oxidizer comprises from approximately 0.3% to approximately 10% hydroxylamine and from approximately 0.1% to approximately 3% hydroxylamine nitrate.

12. A composition as in claim 11 further comprising from approximately 0.001% to approximately 12% hydroxylamine sulfate.

13. A composition as in claim 11 or 12 further comprising sufficient acid such that the pH of said composition is in the range from approximately 2.0 to approximately 5.0.

14. A composition as in claims 11 or 12 further comprising a material selected from the group consisting of insoluble complexing agents, soluble complexing agents, free radical inhibitors and mixtures thereof.

15. A composition as in claim 14 wherein said insoluble complexing agent is selected from the group consisting of benzotriazole, 1,6-dioxaspirol [4,4] nonane 2,7-dione, dioximes and mixtures thereof.

~~16. A composition as in claim 15 wherein said dioxime is 2,4-pentadione dioxime.~~

17. A composition as in claim 14 wherein said soluble complexing agent is selected from the group consisting of citric acid, copper-complexing catechol derivatives, copper-complexing alpha organic acids, copper-complexing hydroxamic acids, copper-complexing amino acids, copper-complexing dicarboxylic acids and mixtures thereof.

18. A composition as in claim 14 wherein said free radical inhibitor is selected from the group consisting of hydrazine, hydrazine derivatives, hydrazine salts, hydrazids, hydrazid derivatives, and mixtures thereof.

19. A composition as in claim 18 wherein said hydrazine derivative is 4-hydrazine benzoic acid.

20. A composition as in claim 11 or 12 further comprising an abrasive.

21. A composition as in claim 20 wherein said abrasive is selected from the group consisting of silica, alumina, ceria, titania, zirconia and mixtures thereof.

22. A composition as in claim 24 wherein said abrasive comprises colloidal silica.

23. A composition as in claim 22 wherein said abrasive comprises milled alumina.